VocALign PRO 4 VST

VST3 Plug-In

for Cubase and Nuendo

User Manual

Manual Version 1.0.1

SYNCHRO ARTS

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Important Notes

- In this manual, 'VocALign PRO 4 VST' will be referred to simply as 'VocALign PRO' or simply 'VocALign'.

Technical specifications

- This program is compatible with Steinberg Cubase 4.5.2 and 5, also with Nuendo 4.3 and above, running on Mac OS 10.4.9 and above, or on Windows XP and above.
- VocALign PRO 4 VST is a VST3 plug-in.

Acknowledgements

- Special thanks goes to our beta testers and Steinberg staff for their help and support.
- Thanks to Steve Cooke for providing the English voices in the demonstration audio.
- VocALign is developed and sold under license from Wordfit Limited.

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A Introduction to VocALign

What is VocALign?

VocALign is a process that automatically edits the timing of one audio signal to match another. In this version it is implemented as a VST3 plug-in that works with Cubase or Nuendo.

How does VocALign work?

VocALign works by applying varying amounts of time stretching or compression to one signal (called the 'Dub') to make its energy peaks and troughs align in time with a 'Guide' signal. It does this in three main steps as shown in Figure 1.

VocALign analyses the Guide and Dub audio signals using identical spectrum analysers to produce time-varying energy patterns. Then it uses advanced pattern recognition techniques to examine the energy patterns and determine the best way to 'warp' the time structure of the Dub signal so that its energy pattern is matched to that of the Guide. The time-warping path describes the best time-distortion of the Dub for matching to the Guide. The time-warping path is fed to an audio editing processor that time-compresses and expands the Dub audio to create the aligned version based on the path. It is this edited version of the Dub that is returned to the audio editing software for the desired use.

Note: In the above diagram, the spectrum analyser colours match those used in the VocALign screen for Guide and Dub audio signals and controls.

How can VocALign help?

If you are a dialogue editor needing to lip-synch vocals, or a music editor needing to tighten-up lead or backing vocals, instrumental tracks, or perform a number of other alignment tasks, then VocALign will help you.

Working without VocALign

A dubbing session for film post-production or music production begins with a guide track. Then the voice-over artist, singer, or musician will dub this as closely as possible.

Because humans are not machines, they will not be able to get exactly in time with the Guide. This is generally not acceptable for lip-synching, nor for double-tracking of vocals

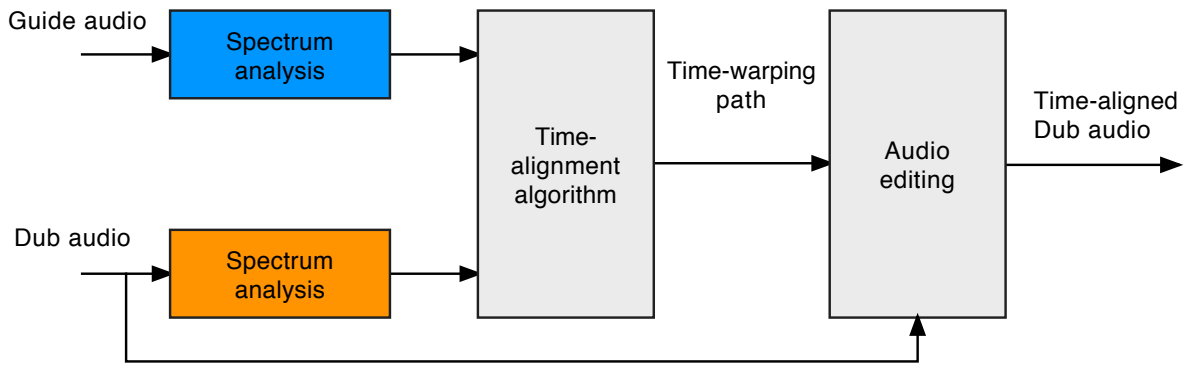


Figure 1 VocALign block diagram

or instruments. Often, the next step is to loop-record the more tricky sections individually, but this can break-up the natural flow of the line. Lastly, the editor will attempt manually to cut and nudge individual sections of the new recordings into time with the Guide.

The above process can take many hours for both the artist and the editor.

Working with VocALign

The above process becomes a simple matter of getting the artist to concentrate on creating a great performance, rather than worrying about the fact that it may drift in and out of exact synch with a previous performance. VocALign can then be used to adjust the timing by automatically time-stretching and compressing the material to allow the Dub to take on the same timing pattern as the Guide.

This saves studio time, saves artists time and improves the quality of results. Most importantly, artists are allowed to produce their best performances, free from the rigidity normally associated with dubbing.

B Applications

VocALign was originally designed for lip-synching replacement dialogue for film and video post-production but it has been adapted to work successfully in the following applications:

- Synching replacement dialogue in post-production for film and video.
- Double-tracking vocal parts or instrumental parts
- Tightening the ensemble of singers with one another, or with the lead vocal
- Tightening the ensemble of backing instrumental tracks
- Synching a drum machine audio-output to a real drummer (or vice versa)
- Giving a dubbed vocal the timing of a 'live' vocal performance
- Changing the voice or even apparent sex of a singer or actor's performance
- Replacing the vocals from a music video shoot with a production track, achieving perfect lip-synch
- Foreign language dubbing

C Basic and advanced operation modes

VocALign PRO 4 has two modes of operation: BASIC and ADVANCED.

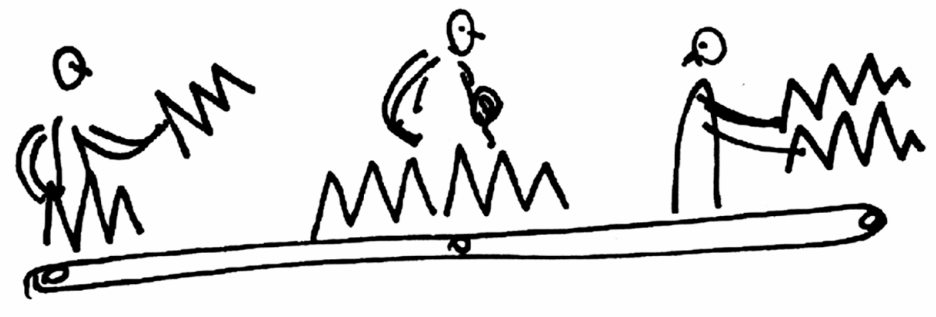
In both modes VocALign automatically aligns the selected Guide and Dub audio regions, using either time or frequency domain processing. In VocALign, you can trim the starts and ends of regions to be processed and control the degree of flexibility in the time-warping (alignment) process.

BASIC mode uses an alignment algorithm that has compatible behaviour to VocALign Project. The ADVANCED mode uses a more sophisticated and robust alignment algorithm, which generally results in more successful and accurate alignment. It also provides more flexibility and control during the alignment process and may work better with audio signals that are difficult to align in BASIC mode. In general you should use ADVANCED mode unless you specifically want the algorithm to behave like VocALign Project.

The ADVANCED mode adds two important controls: one that enables you to determine 'synch points' and the other to select 'protected' regions in the audio to be aligned. Synch points are pairs of pointers that relate specific locations in the Dub to specific target locations in the Guide. VocALign will try to ensure that the points are put in synch. In essence this enables you to attempt to 'force' VocALign to match the audio at these points. Protected regions are user-specified parts of the Dub audio that will not be affected by VocALign's time warping.

VocALign PRO also includes frequency domain editing, in addition to the normal time domain editing available in the VocALign Project version. This can be useful for getting good results on single line melodic material such as solo singers or instrumentalists.

These features are covered in more detail later in this manual.



D Software installation

If you have not already done so, you can download VocALign PRO 4 VST from www.synchroarts.com and install it. The disk image (.dmg) file (Mac) or executable (.exe) file (PC) that you download should open and the installer run automatically after downloading. If the Mac installer does not run automatically, for any reason, open the disk image that is mounted on the desktop and double click the VocALign package icon contained therein. You will be guided through the various steps to install the software. This will install the necessary VST extensions onto your computer.

Demonstration mode

When you first download and install VocALign PRO 4, it will run in a *fully functional* demonstration mode for the number of days shown in the start up screen that appears when you open the plug-in in Cubase or Nuendo. If you have not already purchased a license, clicking the **Buy** button will take you to the Synchro Arts on-line store where you can purchase a license to authorise the software using iLok (see below). Clicking the **Try** button will allow the plug-in to operate in the time-limited demo mode.

Software authorization

VocALign uses the iLok system for authorization and, once installed, your license will reside on a USB 'smart Key' (shown in Figure 2). This is different from the USB 'dongle' that is used to authorize Cubase or Nuendo. If you already have a license installed on your iLok, you can skip this section on authorization.

Once your iLok Key contains a VocALign license, plug the Key into a USB port on the computer that runs your audio editing software to run your VocALign in an authorized mode.

Ilok Keys can hold licenses for a number of protected software products. You can have licenses from Synchro Arts and other software vendors on the same iLok. Licenses for VocALign are downloaded from an iLok.com account.

What is iLok.com?

The www.iLok.com website (provided by PACE) lets you create a personal account which is used to manage your software licenses. If you don't have a user account you will need to create one before you can authorise VocALign.

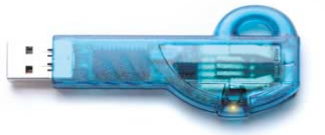


Figure 2 iLok Key

On www.iLok.com, you can receive new licenses from software publishers such as Synchro Arts, see what licenses are on your iLok Keys, register your licenses and move your licenses between iLok Keys. Using software available from iLok.com, you can transfer licenses from iLok.com to your computer and also identify the iLoks you currently have connected to the USB port on your computer. Synchro Arts may also use your iLok.com account to provide your license and give you technical support.

First time using iLok?

If this is the first time you have used iLok you may need to download and install the Inter-Lok extensions and drivers from iLok.com (currently at http://www.ilok.com/download-ilok-software.html).

Obtaining your license

1. If you haven't done so, you need to inform Synchro Arts (or your software dealer) of your iLok.com User ID (This is normally done when you purchase your software.)
2. Synchro Arts will deposit a license into your iLok.com account and notify you.

Failure to keep your iLok.com account up to date may result in delays in providing you with services or other support.

System requirements: To use iLok with VocALign PRO 4, you will need a computer with a USB port, an Internet connection, Mac OS 10.4.9 or later, or Windows XP or later.

How to install your VocALign PRO 4 License from iLok.com onto your iLok Key

1. Insert the iLok Key into an available USB port on your computer and ensure its indicator light is lit.
2. Log in to your account at www.iLok.com.
3. On iLok.com, if you have received notification from Synchro Arts that your electronic license has been deposited, then your authorization is available for transfer. Your iLok.com account will display a notice saying 'You have licenses'. Select that link to start the transfer.
4. The next page on iLok.com will display the pending licenses available for download, along with the name of the plug-in, the manufacturer, the type of authorization (Demo, Not For Resale, or License), the date the authorization was deposited, and the date when the authorization will no longer be available for download from the server.
5. Before an authorization transfer can take place, synchronize your iLok Key with iLok.com.
6. Once you have synchronized your iLok, select the authorization(s) you wish to transfer to your iLok. If you have multiple iLoks connected to your computer, it is important to select the correct iLok as the destination to which you want an authorization to be transferred.
7. On iLok.com, click **Download Licenses** to begin the process. When the transfer finishes you will be asked to confirm completion, indicating that the transfer was successful.

How to authorize your VocALign PRO 4 software with your iLok Key

If you followed the above procedure correctly, and the iLok Key with the plug-in authorization is inserted in the computer running the plug-in, the plug-in should run in an authorized mode by simply launching Cubase or Nuendo and then the VocALign plug-in.

Reauthorising VocALign if iLok is removed

If you subsequently try to run the VocALign plug-in without the iLok inserted into your computer the window shown in Figure 3 will appear. Press **Buy** and reinsert the iLok containing the relevant license. The software will be reauthorised.

ILok Support

For further information on iLok, go to www.iLok.com.

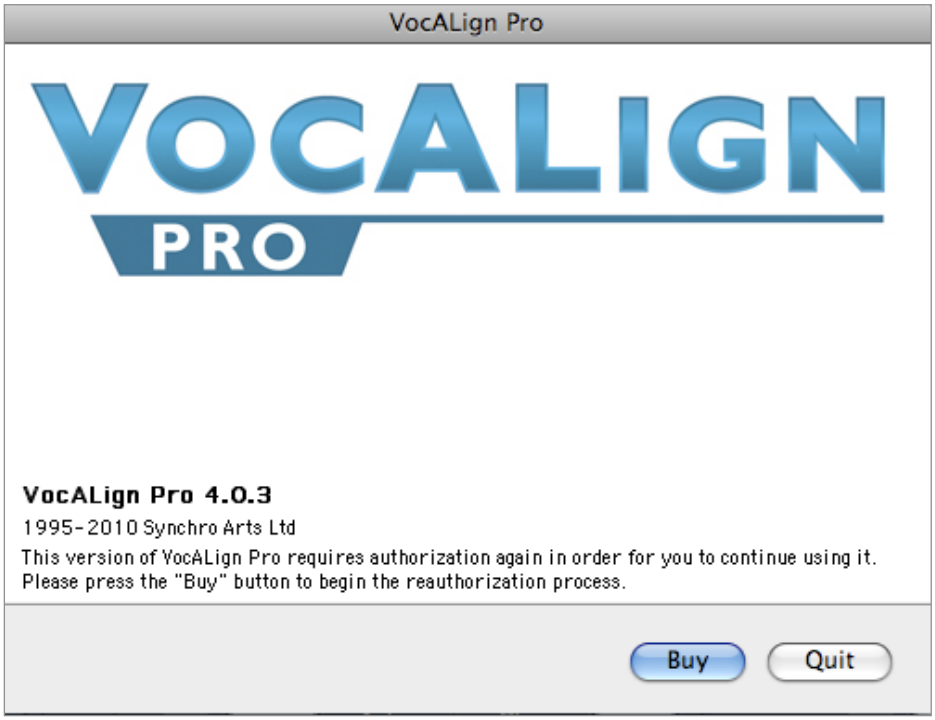

VocALign Pro
VOCALIGN
PRO
VocALign Pro 4.0.3
1995-2010 Synchro Arts Ltd
This version of VocALign Pro requires authorization again in order for you to continue using it.
Please press the "Buy" button to begin the reauthorization process.
Buy
Quit

Figure 3 Reauthorisation window when no iLok is present

E Getting started

To learn to use the basic functions of VocALign PRO 4 only takes a few minutes, but for quickly getting the best understanding we strongly recommend that you first follow the brief tutorial in Section F, which uses prepared audio examples. The following, however, is a Quick Start guide for those that want to jump straight in without following the tutorial. Although the plug-in works with Cubase or Nuendo, the text refers to use with Cubase. The two user interfaces are very similar.

Quick start

1 In the VST>Plug-ins page of Cubase's Preferences, disable (untick) the setting 'Suspend VST3 plug-in processing when no audio signals are received'.

2 In Cubase, add VocALign PRO as an Insert on the track to be aligned (the 'Dub' track) by selecting **Other>VocALign Pro** from the list of plug-ins that drops down when you click on an available Insert slot, as shown in Figure 4.

Click on one of the spare inserts in Cubase to select VocALign Pro from the 'Other' plug-ins

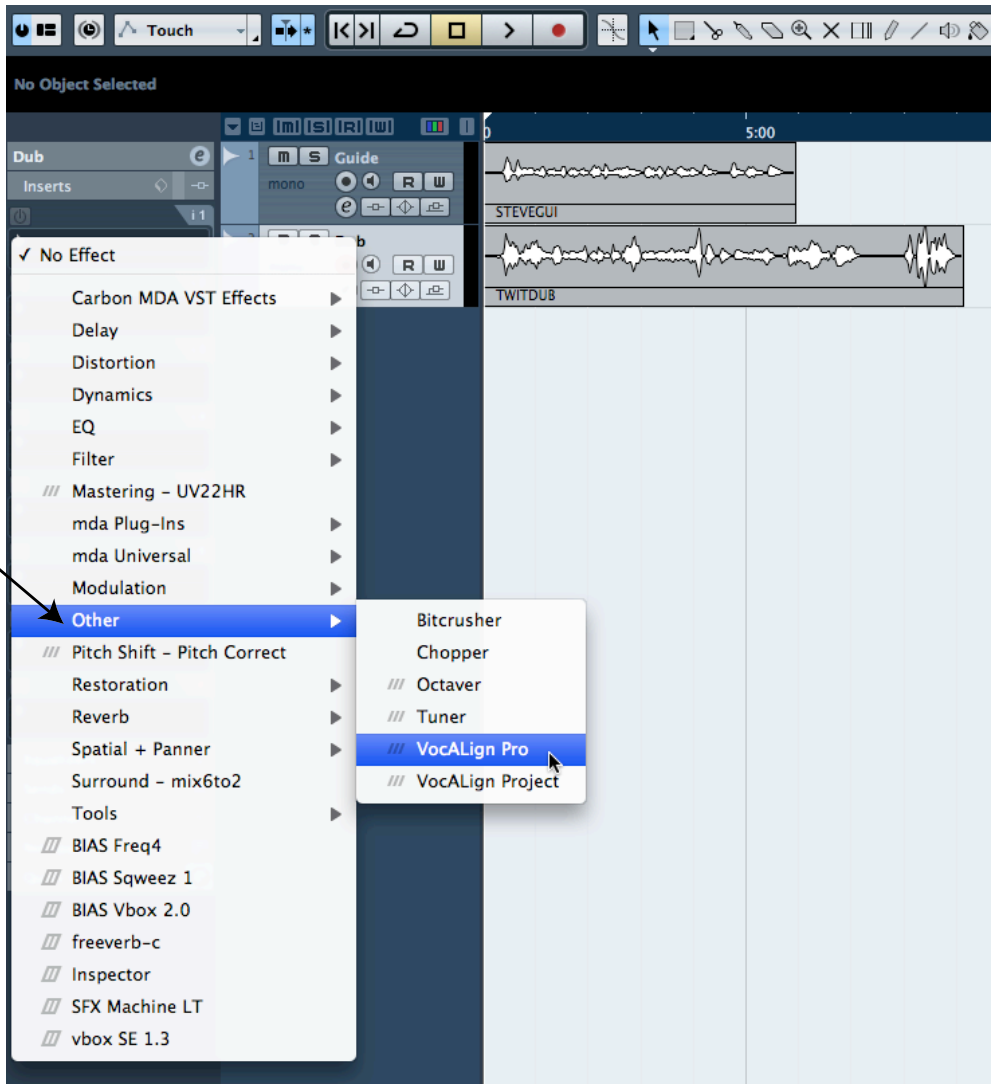


Figure 4 Selecting VocALign Pro as an Insert in Cubase

Figure 5 VocALign window before audio capture

Press this button to turn on the side chain input to VocALign

Figure 6 Turning on the side chain input

3 The VocALign plug-in window will open as shown in Figure 5.

4 Turn on the side chain input in VocALign by pressing the fifth button from the top left of the plug-in's window, as shown in Figure 6.

5 Now select a 'Guide' track in Cubase (the material to which the Dub will be aligned) and route one of its Sends to the side chain of the Dub track Insert that controls VocALign, as shown in Figure 7. Turn on the Send and set its gain to 0 dB.

6 In Cubase, select the start point of the audio you want to process, using Cubase's time line. (The Guide and Dub audio should be approximately in the same place and the start point should be within low level noise before the chosen audio material.)

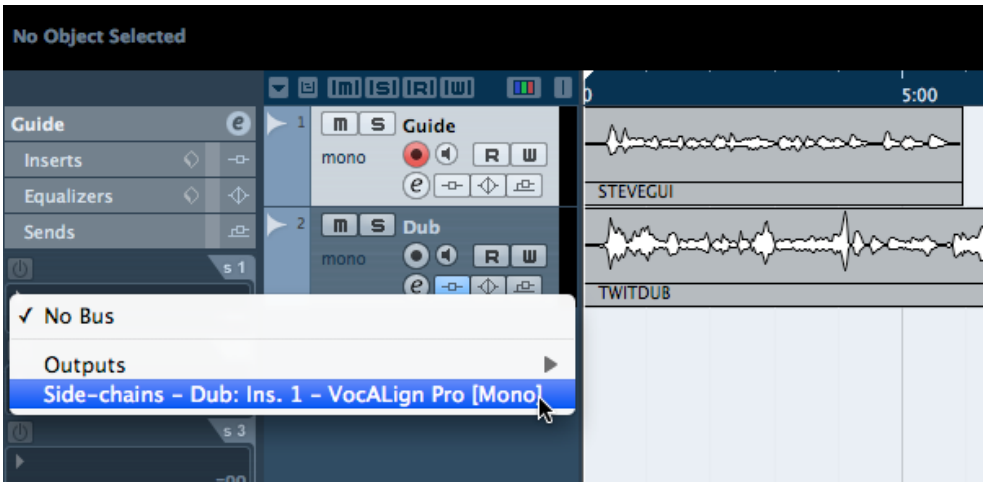


Figure 7 Route a Guide track Send to VocALign's side chain

Figure 8 VocALign display after audio capture

7 In the VocALign window press **Capture Audio**. The light in that button will glow yellow and show **Stop Capture** to show that it is waiting for audio. (You can press it again to cancel the capture if necessary.)

8 Press **Play** (space bar) in Cubase. The light in the button will flash green while the audio is being captured. The selected section of the Dub track will be loaded into VocALign. Press **Stop** in Cubase (space bar) when you reach the end of the audio material to be captured and a pair of waveforms will be displayed in the VocALign window showing the selected Guide and Dub audio (see Figure 8 above).

9 In the VocALign window select **Advanced** align mode, **Time Domain** editing and **Normal Flexibility** (these are the default settings). Provided the Guide audio content is sufficiently similar to the Dub, starts in roughly the same place and has a small amount of lead-in containing a bit of background noise, press **Edit** and the Dub audio will be aligned to the Guide audio as well as possible. The display changes to an energy plot of the two extracts and in the Guide window the yellow trace shows how the energy of the Dub is matched to that of the Guide. Press **Play** in Cubase, after moving the time line back to the start of the region in question, and you will hear the effect of the alignment.

10 Use Cubase's **Export...>Audio Mixdown** function to create an audio file of the Aligned Dub. (This can be found under Cubase's File menu, as shown in Figure 9.) Set Cubase's location indicators so that they highlight the time region of audio that is to be mixed down. Select the Dub track to be mixed down. The mixdown options are discussed in more detail in the Tutorial. Make sure the original tracks in Cubase are not muted, faded down or solo'ed, then press **Export** to create the aligned file. This will be available in Cubase's Pool and can optionally be written to a spare track as part of the mixdown process.

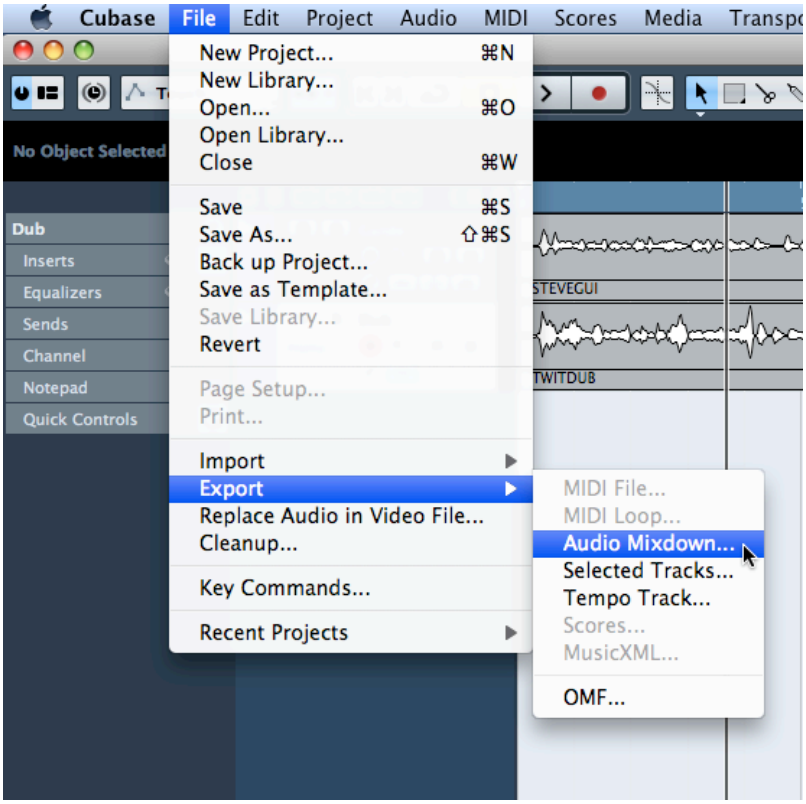


Figure 9 Selecting Audio Mixdown as an Export option

F Tutorial

This tutorial guides you through the use of VocALign in easy stages, so that you can learn about how it works and how best to use it. It uses a prepared Cubase project that can be downloaded from the Synchro Arts website. (This can also be opened and worked on in Nuendo, although for the rest of this tutorial it will be assumed that you are using Cubase. The two user interfaces are very similar.) You will learn how to:

- Select the Guide and Dub audio that will be processed in VocALign
- Transfer the Guide and Dub audio into the VocALign plug-in
- Use VocALign to create an Aligned (synchronized) Dub and audition it
- Return the Aligned Dub audio to Cubase

Step 1 Obtain the tutorial project and audio

The Cubase project for the tutorial session can be found by going to www.synchroarts.com and locating the **Downloads** page. On the Downloads page, locate and click on the link **Cubase Project for VocALign VST** to download a copy of the tutorial project to your computer. Copy the contents to a suitable folder on your computer's hard disk. The copied material should contain the file and folders shown in Figure 10. The .cpr file is the Cubase project file, and the folder called 'Untitled' contains Audio and Image folders for the project. In the Audio folder are contained the two audio files used in this tutorial – 'STEVEGUI.WAV' and 'TWITDUB.WAV'.

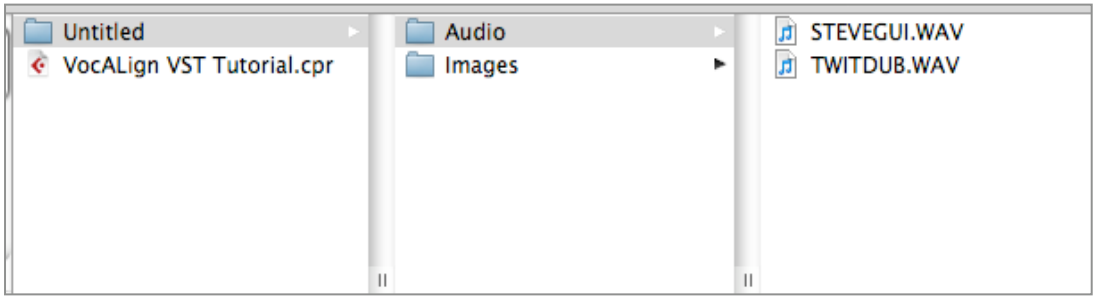


Figure 10 Contents of the tutorial project download

Step 2 Open the project in Cubase

When you open the project file in Cubase you may get a message that the project has been moved (because Cubase thinks it was created somewhere else). Simply click on the button **New** to select the location to which you have copied it as the project directory. The displayed project should look similar to that shown in Figure 11 (next page). You may need to do a bit of zooming and rearranging to fit your screen.

In the VST>Plug-ins page of Cubase's Preferences, disable (untick) the setting 'Suspend VST3 plug-in processing when no audio signals are received'. If this setting is enabled then Cubase will not replay the complete Aligned Dub when the Aligned Dub is longer than the original.

Step 3 Add VocALign as an insert

In Cubase, add VocALign PRO as an Insert on the Dub (Audio 2) track by selecting **Other** from the list of plug-ins that drops down when you click on an available Insert slot,

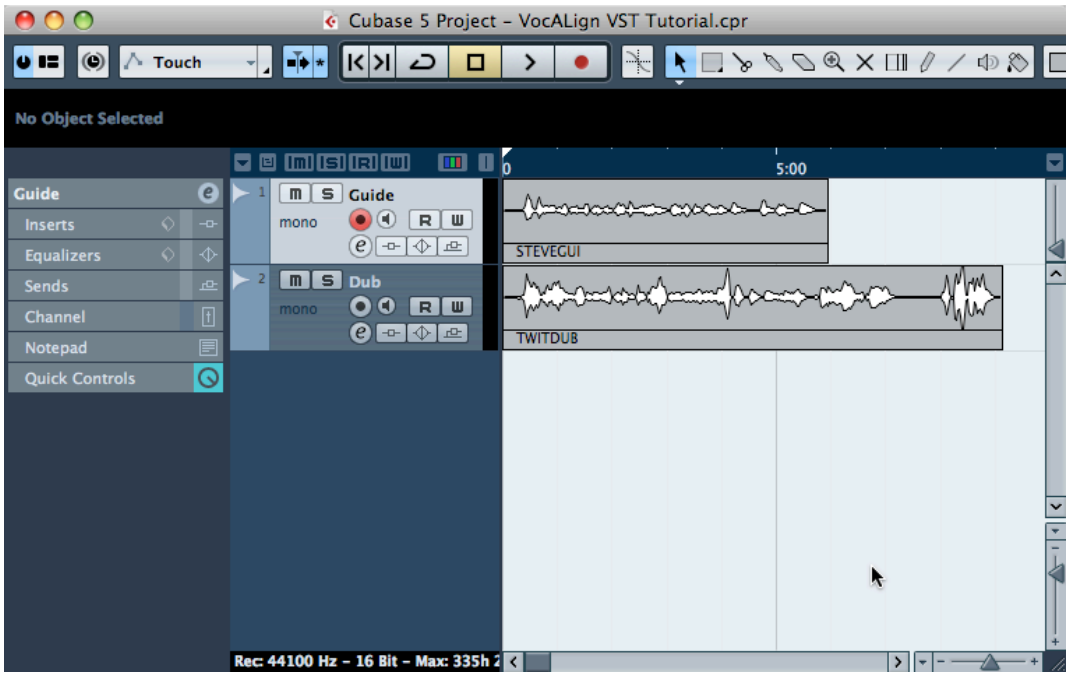


Figure 11 Tutorial project display in Cubase

Click on one of the spare inserts in Cubase to select VocALign Pro from the 'Other' plug-ins

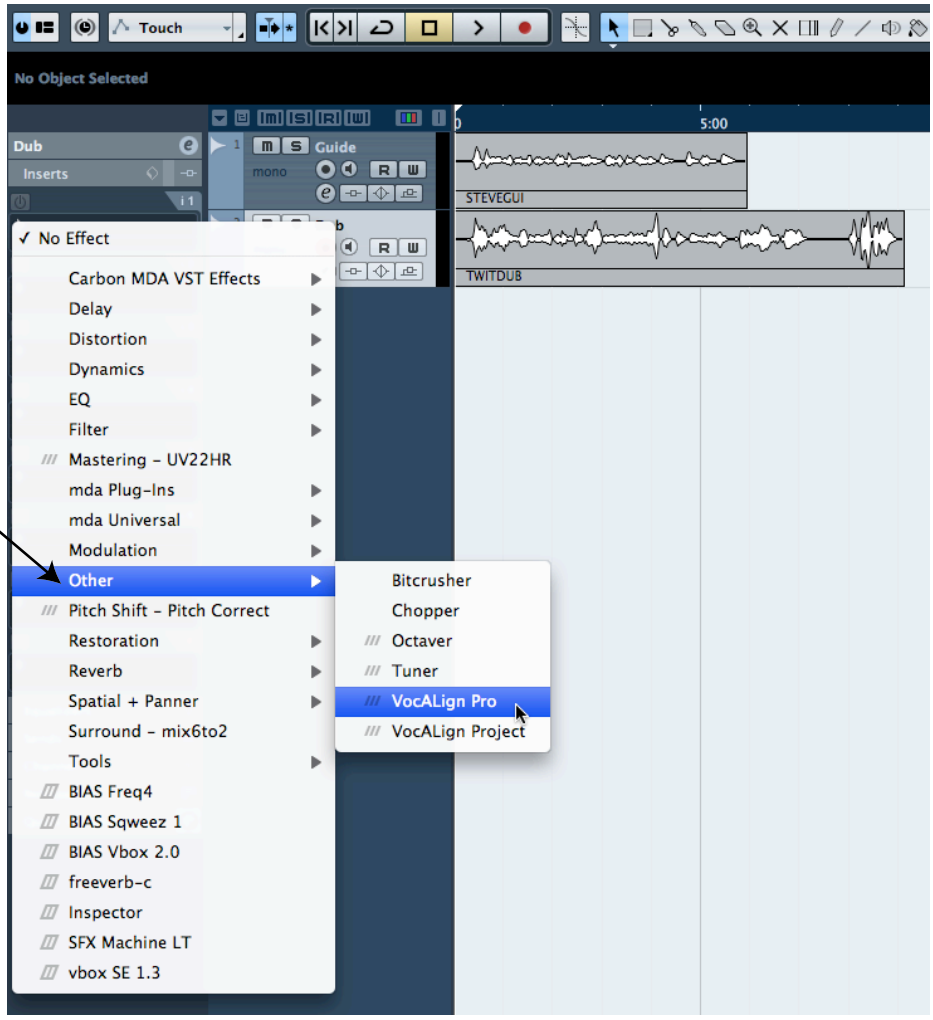


Figure 12 Select VocALign Pro as an Insert in Dub track

Figure 13 VocALign Pro plug-in editor window before audio capture

and then **VocALign Pro** as shown in Figure 12. The VocALign PRO window should appear as shown in Figure 13. If you are using a trial version of VocALign there will be an option either to continue using it for a limited number of days by pressing **Try**, or to purchase a license by pressing **Buy** (see the earlier section on software installation).

Step 4 Select the Guide audio as the side chain input

A side chain to the VocALign insert is used to connect the audio track that will be used to guide the alignment process. Turn on the side chain input in VocALign by pressing the fifth button from the top left of the plug-in's window, as shown in Figure 14. The button will now glow orange.

Figure 14 Turning on the side chain input

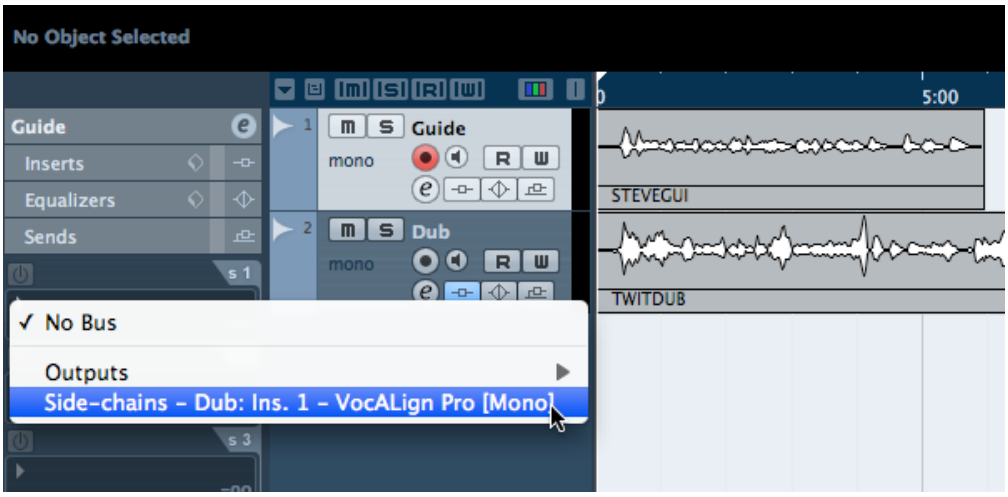


Figure 15 Route a Guide track Send to VocALign's side chain

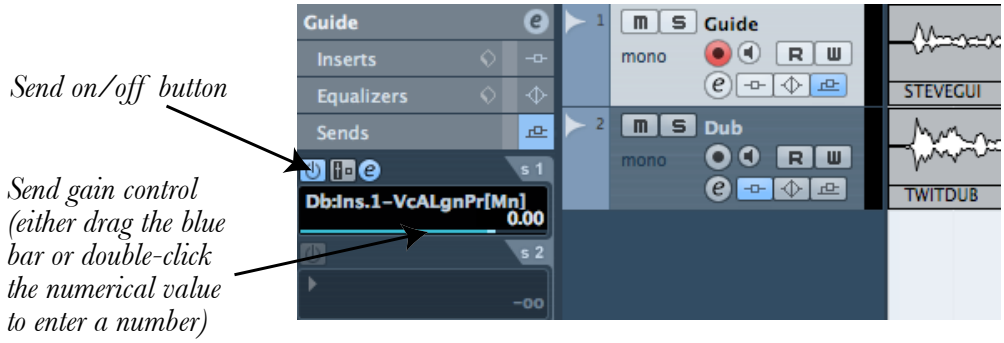


Figure 16 Setting the Send controls in Cubase

Now select the Guide track in Cubase and route one of its Sends to the side chain of the Dub track Insert that controls VocALign, as shown above in Figure 15.

Turn the Send on and set its gain to 0 dB as shown above in Figure 16.

Step 5 Set the start point in Cubase

In Cubase, select the start point of the audio you want to process, using Cubase's time line. (The Guide and Dub audio should be approximately in the same place.) In this case it means dragging the time line back to zero (before the start of the audio extracts.

Step 6 Capture the audio

In the VocALign window press **Capture Audio** as shown in Figure 17 (next page). The light in that button will glow yellow and show **Stop Capture** to show that it is waiting for audio. (You can press it again to cancel the capture if necessary.)

Press **Play** (space bar) in Cubase. The light in the button will flash green while the audio is being captured. The selected section of the Dub track will be loaded into VocALign. Press **Stop** in Cubase (space bar) when you reach the end of the audio material to be captured. A pair of waveforms will be displayed in the VocALign window showing the selected Guide and Dub audio (see Figure 18, next page).

Figure 17 Selecting Capture Audio (left) after which the light in the button glows yellow and shows 'Stop Capture' (right)

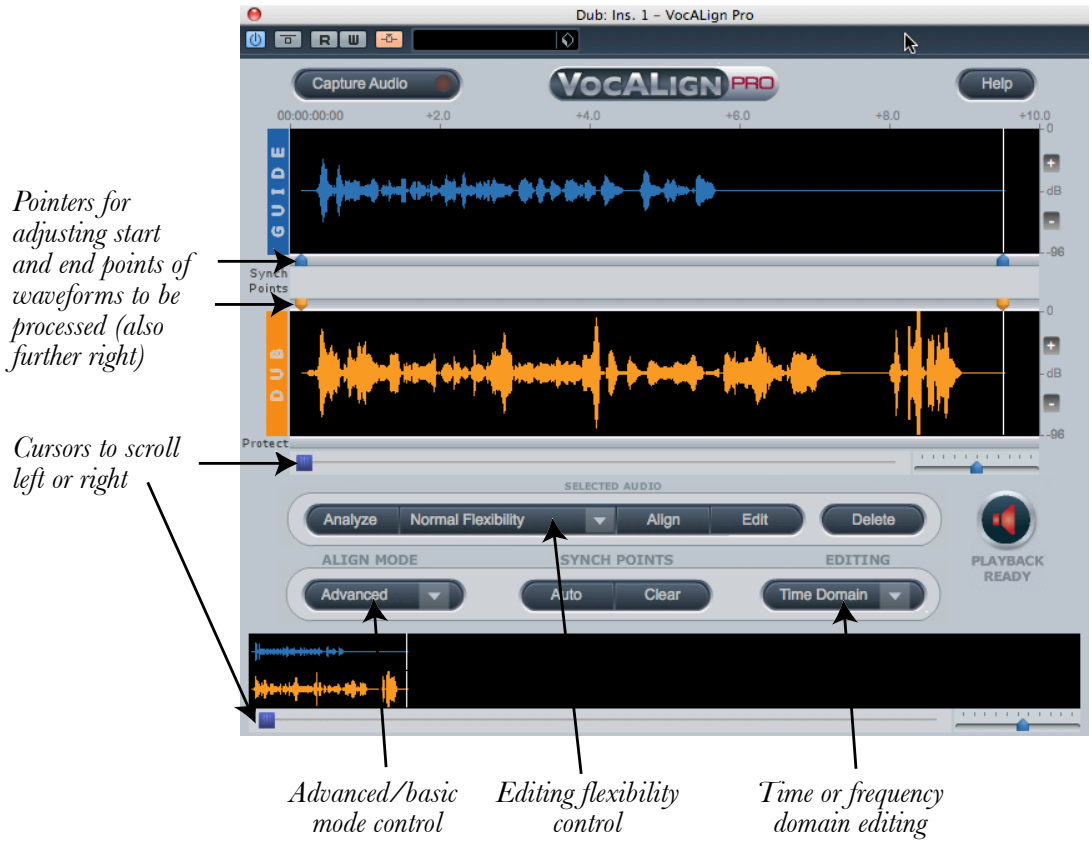


Figure 18 VocALign plug-in editor window after audio capture

TIP: If you need to capture more than one audio region into one instance of VocALign, you may need to use the Overview display at the bottom of the window to select separate regions for processing. Click on the desired waveform to select it. Use **Delete** to delete the selected waveform from VocALign. This is covered in more detail in Section H.

Step 7 Prepare the settings for alignment

Select the **Advanced** alignment mode as shown in Figure 18 above, along with **Time Domain** in the Editing menu to the right of it, and **Normal Flexibility** above and between these two options. (These are the default settings.) This sets up the plug-in with some typical settings for speech alignment.

In VocALign, if required, adjust the start or end of the Guide or Dub audio so that the sections to be aligned are roughly similar in terms of content. This is done by clicking and dragging the waveform from its ends (when first captured), or where it changes colour to grey (after adjustment). The selection can also be made by sliding the blue or orange

Figure 19 VocALign energy display after pressing 'Analyse'

pointers above or below the waveform, as shown in Figure 18. There is a pointer at the beginning and at the end of each waveform to begin with. You may have to scroll to the right in the VocALign window in order to see the pointers at the end of the waveforms. Cubase's transport commands are used to play the audio.

TIP: Try to ensure that the start of the audio selection is in 'silence' (which should be low level noise within an audio segment, rather than an empty part of the track that lies between segments) for about 0.25 seconds before the waveform energy appears. Try to ensure the end of the selected audio is at the desired stopping point.

Step 8 Analyze the audio

In VocALign click **Analyze**. The display changes to show an energy plot of the Guide and Dub tracks (Figure 19, above), which is what VocALign uses to create a time-warp path to match the two extracts. (This step can be omitted because the **Align** or **Edit** buttons will automatically include the analysis step. The **Analyze** control is available to obtain a quick overview of the anlaysis stage without further processing.)

Step 9 Align the Dub audio

Clicking **Align** creates a processed version of the track on which the VocALign plug-in is inserted. You will now see a yellow trace superimposed on the Guide audio track's waveform (see Figure 20, next page), which is VocALign's proposed mapping of the Dub track's energy pattern to match that of the Guide. Initially this is done in a temporary fashion, but soon you can also create a more permanent audio file of the processed version.

Figure 20 Yellow trace over Guide showing proposed alignment

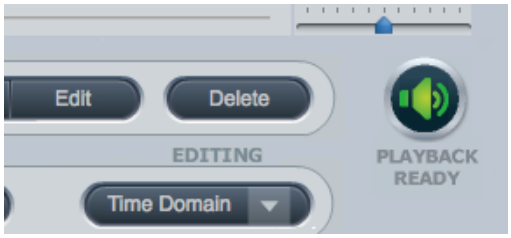


Figure 21 The Green loudspeaker shows that audio is ready to be played

(If you press **Help** then **About** in VocALign, you can see where the plug-in stores these temporary audio files, and you can change that location.)

Step 10 Create the time-aligned version of the Dub audio

Click **Edit** to create a rendered version of the aligned audio that is written temporarily to disk. The red loudspeaker (Not Ready) symbol next to the Delete button will change to green (Ready), to show that the audio is processed and ready to be auditioned (see Figure 21 above).

(While the loudspeaker symbol next to the **Delete** button is red – Not Ready – you won't be able to hear any audio from the track being processed. When it's green you will be able to hear audio.)

TIP: Generally, for the fastest operation, once audio is captured, press only the **Edit** button.

Step 11 Play the aligned audio

Once the edit is completed and the speaker symbol is green, if you press **Play** (space bar) in Cubase (having moved the time line back to the start) you will hear both the Guide and aligned Dub audio together in sync. If you left the start and end pointers unaltered before editing, the laugh at the end of the Dub audio will still be audible and a little time-compressed. (VocALign's mapping of the two energy patterns, as shown by the yellow trace, results in an overall shortening of the Dub audio.)

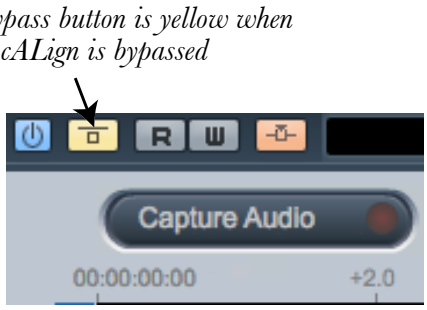


Figure 22 Bypass button in VocALign editor window

The bypass button in the top left hand corner of VocALign's display (see Figure 22) allows you to temporarily turn off the processing of this plug in so that you can hear the original unprocessed audio. The button is yellow when the plug-in is bypassed. Be sure to turn bypass off (i.e. *not* bypassed) if you want to use the Aligned audio.

If you move the Guide's end marker (right hand blue pointer) to just after the end of the Guide signal, then press **Edit** again so as to regenerate the Aligned Dub, the laugh at the end of the dub will be left unprocessed and will remain at the original speed. You can move the right hand orange pointer as well if you wish (the Dub's end marker), so that the Dub energy end point is before the laugh starts, then press **Edit** again. This will eliminate the laugh from the processed version.

Step 12 Create an audio file of the aligned Dub

In order to create an audio file of the processed version (of the Aligned Dub), select the **Audio Mixdown** function, which is under **Export…** on Cubase's **File** menu, as shown in Figure 23.

Set Cubase's location indicators so that they highlight the time region of audio that is to be mixed down. As shown in Figure 24 (next page), this is done by dragging the small triangular markers at the top of the time bar above the audio tracks, so that one is at the start and one at the end of the region. If none exist, you can

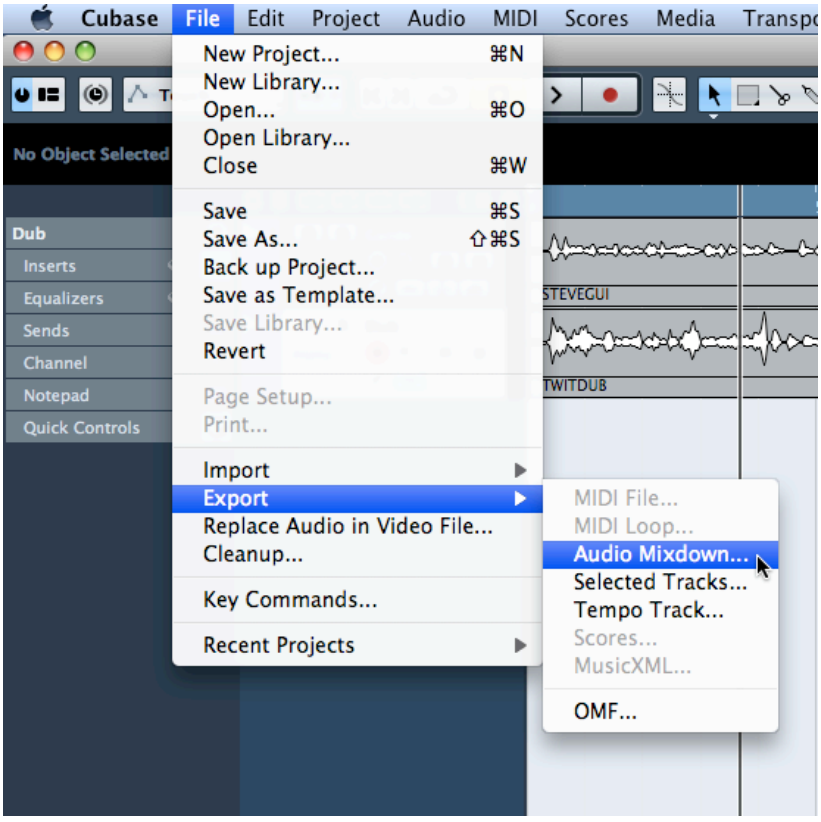


Figure 23 Audio Mixdown selected from Export options under the File menu

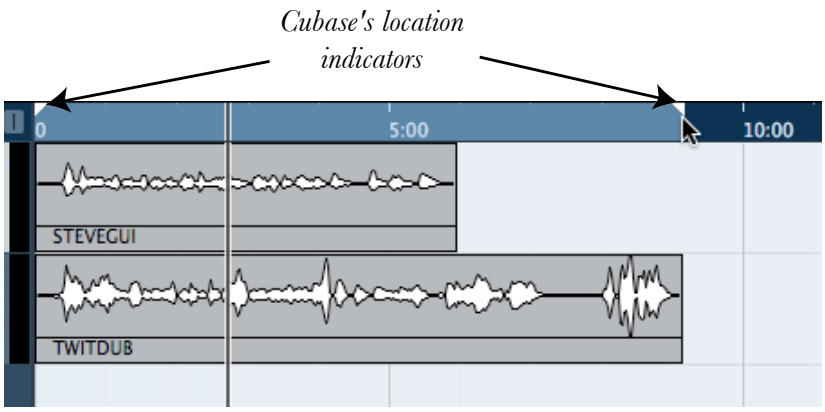


Figure 24 Setting Cubase's location indicators to highlight the region for mixdown

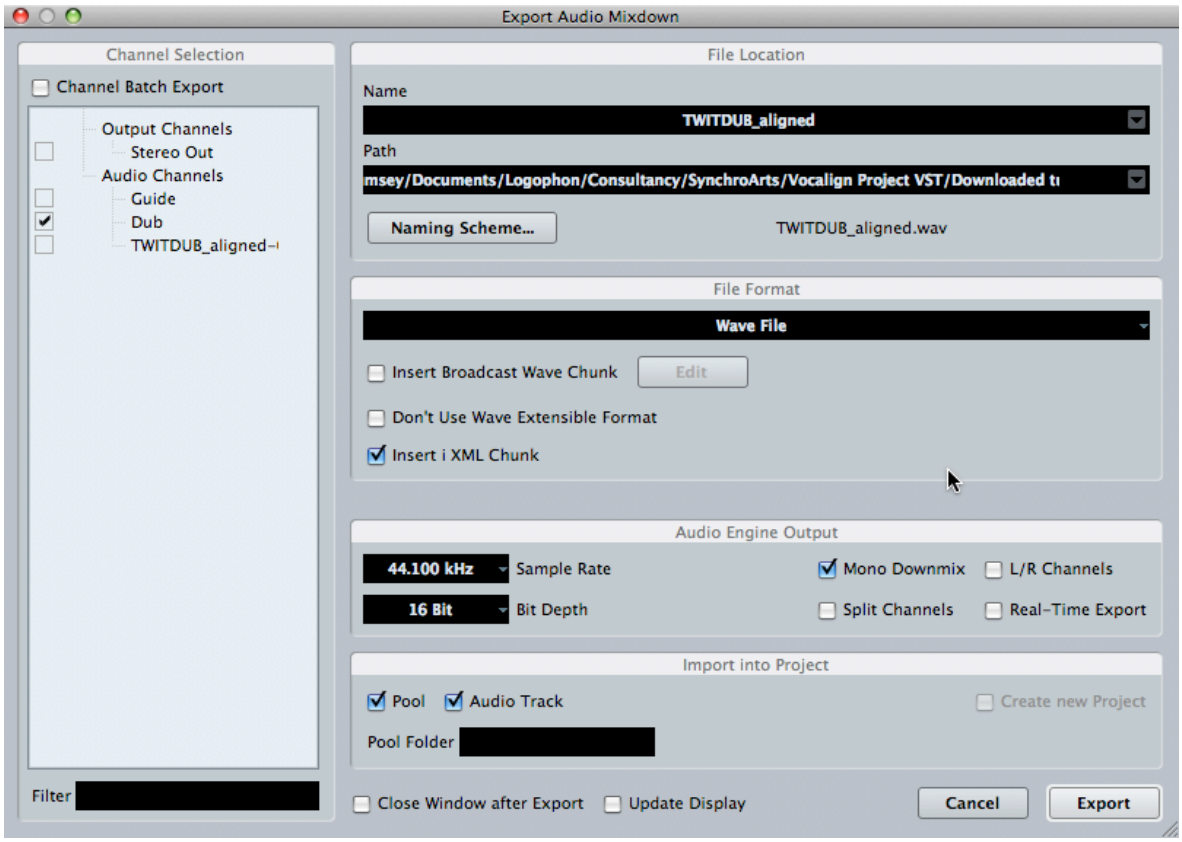


Figure 25 Cubase's audio mixdown options

make them by moving the cursor into that area of the time bar until the cursor turns into a pencil, then clicking to create a location indicator that can then be dragged.

The mixdown options are shown in Figure 25. Under **Channel Selection** on the left, choose the Dub audio channel only. The new region can be named in the box at the top of the 'Export Audio Mixdown' window (shown here as 'TWITDUB_aligned') and a path (folder location) for the new file chosen. You can set various file saving options according to the needs of your project. A mono downmix would be the normal option for VocALign processing. If you tick **Audio Track** in the 'Import into Project' at the bottom, the pro-

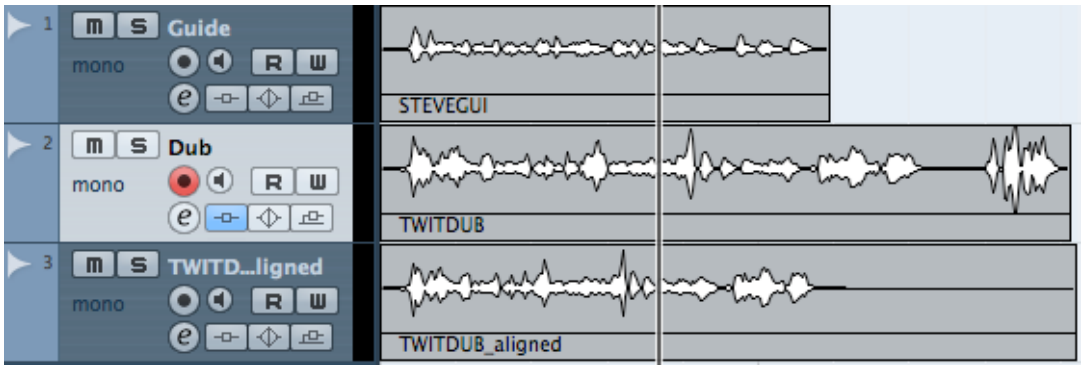


Figure 26 The newly aligned Dub track has been mixed down to track 3 in Cubase

cessed region will be bounced onto a new track in sync with the start of the original one, as well as being made available in Cubase's Pool.

Make sure the original tracks in Cubase are not muted, faded down or solo'ed, then press **Export**. The aligned file will then be created and written to an audio track. In Figure 26 you can see the new 'TWITDUB_aligned' track with the fitted version of the Dub audio. If you play it along with the Guide track these should be in sync (mute the unprocessed Dub track first)

TIP: Do not save the modified Cubase tutorial session over the original downloaded session when exiting Cubase, so that it can be used again. Save the modified one with a different name.

Step 13 Using advanced features of VocALign Pro

VocALign Pro has a number of advanced features that enable you to control the way VocALign aligns material. Guidance on the use of 'synch points' and 'protected regions' is given in Section I. Section H also includes a number of tips and tricks for effective operation.

G VocALign PRO 4 screen contents and controls

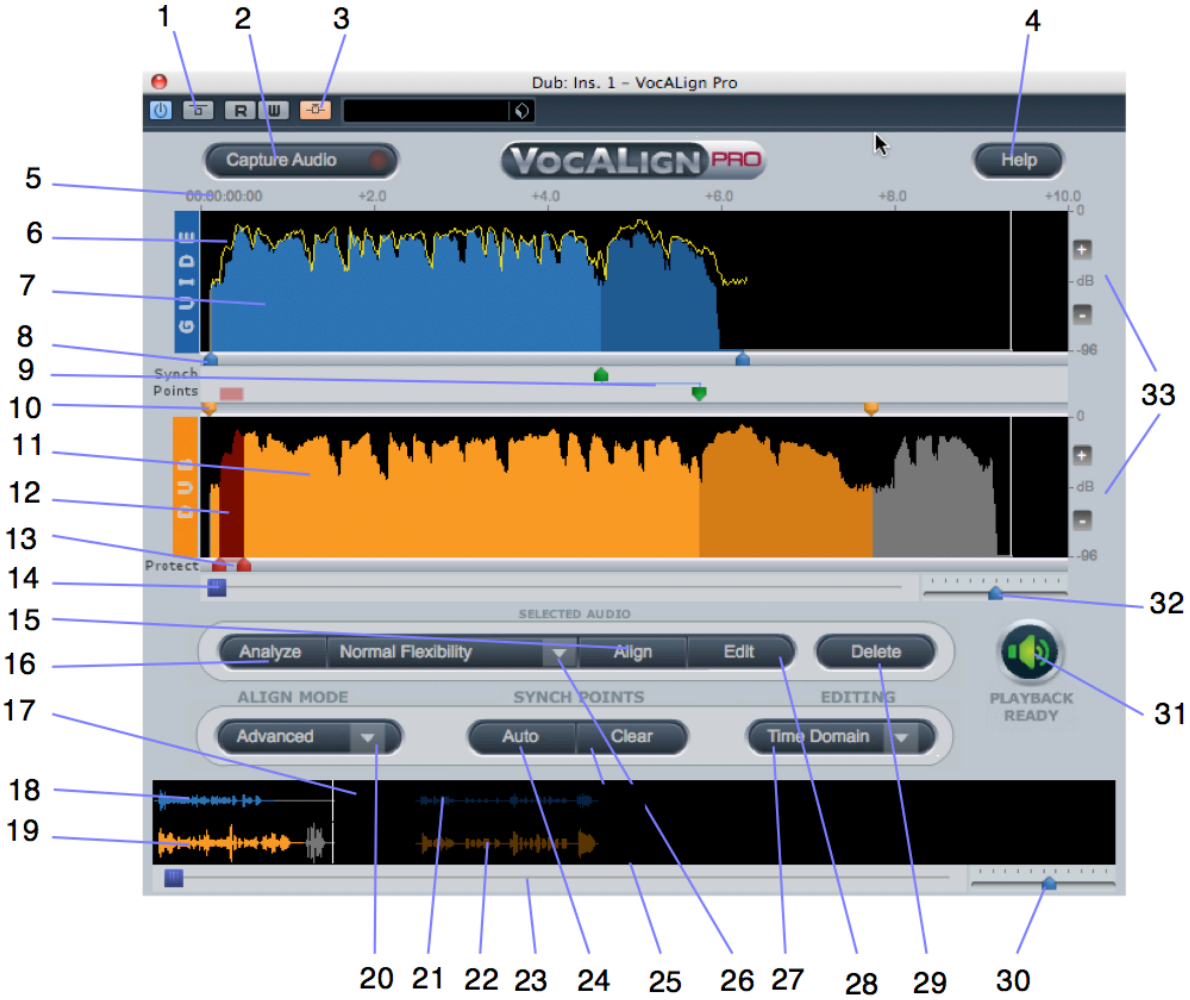


Figure 27 Key to VocALign screen contents and controls

1) **Bypass button:** bypasses any VocALign processing applied on this Insert. If OFF (grey), VocALign plays and transfers aligned Dub audio (as long as (31) is green). If ON (yellow), VocALign plays and transfers original (unprocessed) Dub audio.
2) **Capture Audio button**: arms VocALign to receive Guide and Dub audio from the editor during a play pass. (Yellow when waiting for audio, flashing green when capturing audio.)
3) **Side chain button**: turns on the side chain input to VocALign (normally routed from a Send of the Guide track). (Orange when ON.)
4) **Help button**: click to access help tips.
5) **Display start time and time offsets** – shows position of captured audio referenced to the editor time line.
6) **Aligned audio trace**: a representation of the energy of the new aligned signal.
7) **Guide energy**: a profile of the energy of the Guide signal in time. Display elements relating to the Guide are coloured blue.
8) **Guide start point selector**: adjusts processing start. (The corresponding end point selector is shown further to the right).

9) **Synch point pair**: click in this region and drag the green blobs to create and adjust pairs of synch points (see Section I).
10) **Dub start point selector**: adjusts processing start. (The corresponding end point selector is shown further to the right).
11) **Dub energy**: a profile of the energy of the Dub signal in time. Display elements relating to the Dub are coloured orange.
12) **Protected region** (see Section I).
13) **Protected region start and end markers**: drag the red sliders to mark regions that will remain unaffected by processing (see Section I).
14) **Scroll bar**: use slider to move waveform position in window.
15) **Align button**: click this to generate and display the aligned Dub audio energy trace in Guide window (does not create aligned audio).
16) **Analyze button**: click to analyze and display the energy plot of the Guide and Dub. VocALign displays the energy in only one band (500Hz – 1kHz) but actually splits it into four bands.
17) **Overview window**: shows multiple captured regions. If more than one independent audio region has been captured these will be shown as separate waveforms in the Overview display area. Clicking one of them selects the Dub and Guide waveforms to be processed. Selected waveforms are highlighted in bright blue and orange, whereas unselected waveforms are dimmed.
18) **Selected Guide waveform**: Guide audio that will be processed.
19) **Selected Dub waveform**: Dub audio that will be processed.
20) **Advanced/Basic mode selector menu**. Use Advanced mode unless you specifically want compatible behaviour with the Project version of VocALign.
21) **Unselected Guide waveform**: Guide audio that will not be processed (shown as darker waveform). (These will only be visible if multiple regions occurring at different time values have been separately captured into the plug-in.)
22) **Unselected Dub waveform**: Dub audio that will not be processed (shown as darker waveform). (These will only be visible if multiple regions occurring at different time values have been separately captured into the plug-in.)
23) **Overview waveform display scrolling**: slide to move display.
24) **Automatic synch point setting**: press to let VocALign pick possible synch points.
25) **Clear synch points**: press to delete all synch points.
26) **VocALign settings**: controls the characteristics of the alignment processing (see section H).
27) **Editing basis**: click to choose between time and frequency basis for non-linear time compression and expansion.
28) **Edit button**: click to generate aligned audio. (31) will indicate when done.
29) **Delete button**: click to remove the selected waveforms from VocALign.
30) **Overview waveform display scaling**: slide to zoom in and out.
31) **Editing complete indicator**: If green ('Ready'), edited (aligned) audio is processed and ready for playback. If red ('Not Ready'), aligned audio is not yet ready to be replayed.
32) **Selected waveform display scaling**: slide to zoom in and out.
33) **Energy scale**: shows range of display.

H Important tips for effective operation

Assuming you have mastered either the Quick Start introduction or the Tutorial in the previous sections, the following will help you to get the best results from VocALign. The text refers to use with Cubase, but the same principles apply when used with Nuendo.

Cubase/Nuendo Preferences

- In the VST>Plug-ins page of Cubase's Preferences, disable (untick) the setting 'Suspend VST3 plug-in processing when no audio signals are received'. If this setting is enabled then Cubase will not replay the complete Aligned Dub when the Aligned Dub is longer than the original.
- On the same Preferences page, you may wish to set Cubase's preferences so that the plug-in editor window is always on top.

Capture

- In Cubase, you will start with a session in which there is Guide (original) audio contained on one track and Dub (replacement or new) audio on a second track.
- In the Cubase Project window, drag the time line (current play time) so that it starts just before the desired portion of the Guide and Dub audio regions for processing. The captured material can include any individual region or multiple regions. Your selection can begin and end in the middle of a region. VocALign PRO works best when working on relatively short regions at a time, for example from 20 seconds to, say, a minute. But effective alignment will depend on many things: e.g. gaps in the signals, how similar they are and other features. Some experimentation will help the user find the best lengths to process for each signal.
- Try to capture up to around 0.25 to 0.5 seconds of 'background' or 'leader' audio at the beginning of your Guide audio selection. This will assist VocALign to set the noise floor levels and allow better alignment at the start of the signal. (In the current version of VocALign PRO 4 VST, the selected audio can be up to five minutes long and must be longer than 0.25 seconds.)
- The Dub does not have to start at the same time as the Guide. In other words, the timecode position of the Dub is not used. The Guide's timecode is important and so is the amount of 'background' captured before the Guide and the Dub.
- Try to leave as much or very slightly more background audio before the Dub signal starts than for the Guide.
- If you capture an audio region that begins in digital silence, VocALign may generate an error as it needs to be able to detect a signal to enable it to set its analysis parameters. Try to start capturing where there is at least some low level background noise within the audio region.

Overview window

- If you capture more than one audio region (in separate capture passes) while the VocALign plug-in is open these will show up as separate waveforms in the overview window at the bottom of the display. You can click on the waveform section that you want to align and this will appear in the upper display ready for processing.

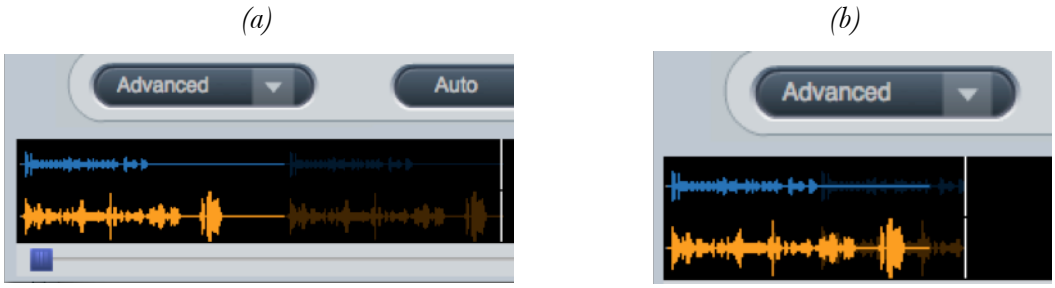


Figure 28 (a) Overview display showing dimmed waveform (to the right) for unselected audio that is separate in time from the selected audio. (b) Showing overlapping regions that have been separately captured

The unselected regions' waveforms are dimmed as shown in Figure 28(a) above. In this case the two regions occupy separate periods in Cubase's timeline, so it is easy to tell them apart in the overview window.

- Selected (highlighted) waveforms in the overview window are those that will be processed by VocALign. If you press **Delete** only the highlighted waveform will be deleted.
- If you have accidentally or intentionally captured more than one region (in separate capture passes) within the same period on Cubase's timeline, one will be overlaid on the other(s) in the overview window, as shown in Figure 28(b). The latest captured one will be highlighted and the other(s) will be dimmed. If they overlap completely you will not be able to see those lying behind and the only way to reveal the hidden material is to delete the highlighted material this is hiding it. However if part of the dimmed waveform is visible in the background, you can click on it to select it.

Trimming the captured material

- Captured audio material may need to be trimmed before alignment in order to ensure that the extracts are optimised for processing. VocALign will work best if Guide and Dub material start at a similar point in their energy profiles, and both have a small period of background noise before they begin.
- It is preferable to trim starts and ends of extracts using the energy display. You can help VocALign do a good job by trimming the audio so as to match initial energy profiles and ensure that there is a good chance of starting the alignment accurately. To convert a captured audio waveform into the energy display press **Analyze**.
- **IMPORTANT**: There is currently no way to return to the waveform display once an energy analysis has been done. The current contents must be deleted and recaptured if you need to start again.)
- You can optionally perform several operations on the energy display waveform itself before alignment:

a) The start and end boundaries of the selected regions can be modified by dragging the blue or orange pointers at either end of the audio selections as shown in Fig. 29, left. The waveform turns grey to indicate unselected audio energy. Alternatively you can position your cursor at the boundary of the coloured audio material (the cursor changes into a pair of horizontal arrows) and drag the boundary left or right.

b) The display can be scrolled horizontally with the scroll bars to examine the captured waveforms. You may need to scroll right to see the end point adjuster.

c) The scale control (Fig. 29, right) can be used to expand or contract the horizontal time scale (slider) or alter the range of the vertical scale in dB (+) (–).

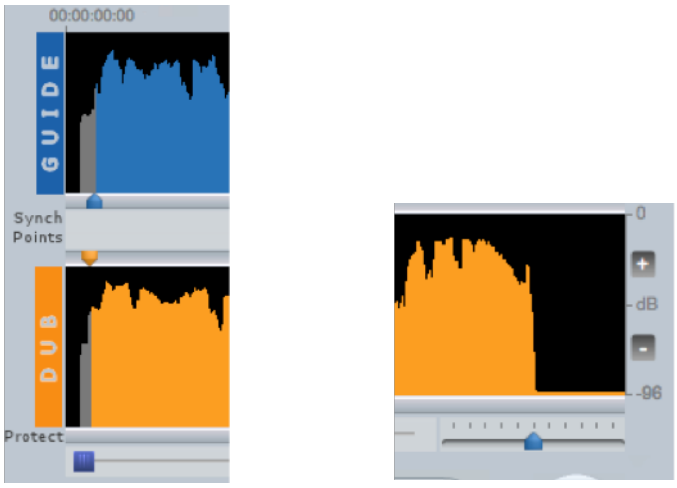


Figure 29 (left) Pointers to adjust start of Guide and Dub energy; (right) scale control

Alignment

- Choose an appropriate VocALign setting before pressing **Align** (e.g. if the Dub is very long compared to the Guide, try 'Maximum Compression'). Guidance is offered in the following section 'Alignment settings'.
- After clicking **Align**, visually inspect the results in the Guide window. The peaks and troughs of the yellow (Aligned Dub) energy trace should line up generally with those of the Guide as in Figure 30.
- If the alignment looks satisfactory, generate the aligned audio by pressing **Edit**. This creates the aligned audio.
- A shortcut is to simply press **Edit** after capturing the audio as this will run the Analyze and Align steps first.
- Preview the results by using the Cubase play controls.

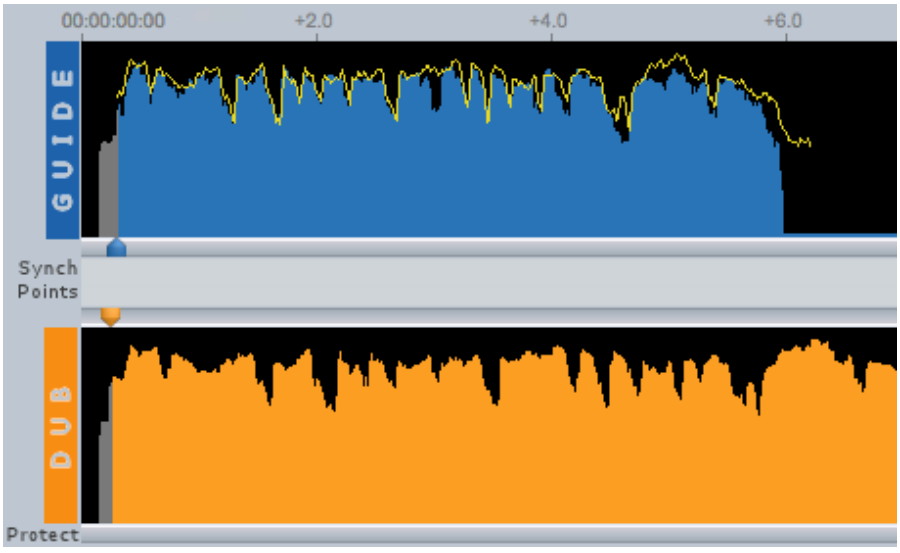


Figure 30 Checking the aligned energy (yellow trace)

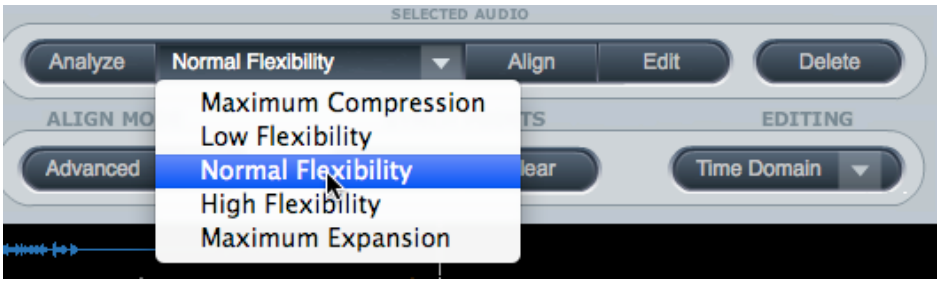


Figure 31 Selecting alignment setting

- If the alignment is satisfactory, transfer the edited audio to Cubase by using the Audio Mixdown function, as described in the tutorial.
- If you make any changes to the selected waveform or energy profile region after initial alignment (such as modifying the start or end points), the yellow aligned energy profile display disappears and **Align** or **Edit** will need to be pressed again to perform a new alignment.
- If the alignment does not look or sound satisfactory, there are a few options:
  a. Select another setting or alignment mode (which will clear the aligned trace), click **Align** again, and examine the results.
  b. Adjust the 'leader' audio before the start of the Guide and Dub to be roughly equivalent, with the Dub leader being slightly longer.
  c. Adjust the end of the Guide or Dub (see previous section).
  d. Reselect and recapture the Guide or Dub audio in Cubase, if the original selection is thought to be causing the problem.

Alignment settings

You can control the alignment settings, which greatly affect how the alignment performs. Use the alignment settings menu to select which preset is active, as shown in Figure 31 above.

The main setting characteristics are described in Table 1.

Setting	*Main characteristics*
Low Flexibility	Alignment is not very flexible, sound quality may be best.
Normal Flexibility	(Default): it is recommended to try this first as it works best in most cases.
High Flexibility	Alignment is the most flexible of the settings, but may compromise sound quality.
Maximum Compression	Tries to match the Guide by time compressing the aligned audio as much as possible.
Maximum Expansion	Tries to match the Guide by time-expanding the aligned audio as much as possible.

Table 1 Alignment settings

In general you will achieve better results by selecting the ADVANCED alignment mode. BASIC mode is provided to offer compatible behaviour with the Project version of VocALign.

Editing modes

VocALign PRO offers two methods of editing the Dub audio. The differences are highlighted in Table 2.

Editing mode	*Optimum signal requirements*	*Advantages*	*Speed of editing*
Frequency	Audio contains only a single pitch. (e.g. one voice or one single – pitched instrument)	Good for reducing editing artefacts in transients and rapid pitch changes when expanding.	Slower
Time	Audio can be single voiced or contain complex signals.	Good for compression and maintaining musical beat.	Fastest

Table 2 Editing modes

Further tips and tricks

Latching

To align just the start of the Dub with the Guide (and leave the rest of the Dub unprocessed), use the Guide End Point Selector to use only select 0.25 to 1.0 second of the Guide audio for processing and keep the Dub signal full length.

Reverb tails

To stop the end of a Dub from being stretched to wrongly match a noisy or reverberant Guide, stop the end of the Guide for processing to be 0.25 to 1.0 second before the Guide signal of interest ends and use the entire Dub.

Controlling the plug-in status

After having first added VocALign as an Insert on a Cubase track, the name of the plug-in will appear on the relevant Insert slot. To change or remove the plug-in, click and hold on the Insert slot and select the appropriate plug-in (or 'No Effect'). To reopen the VocALign window once the plug-in window has been closed, click on the round button in the Insert controls containing an italic 'e' to open the plug-in editor window.

Previewing material

Once the Dub track has been provisionally aligned (before mixing down the aligned audio to an audio file) you can listen to either the Guide track or the Dub track separately by using the track mute or solo controls in Cubase. Mute the Guide track to hear only the Dub track, for example. Use the Bypass control in VocALign to turn on or off the alignment effect. Remember to remove these modifications before mixing down a processed track.

I Advanced mode operation

Synch points

Synch points are used to pick target points where VocALign will try to ensure that the two extracts remain in synch. In essence this enables you to attempt to 'force' VocALign to match the audio at these points. Synch points are created as pairs (displayed as linked green pointers) – one relating to the position in the Guide and one relating to the position in the Dub audio. You can move each point in the pair independently of the other, so that the synch point can be different in the Guide and Dub tracks.

Synch points can be set either automatically or manually. In this example (Figure 32) from the speech material at the beginning of the tutorial audio, automatic synch point selection was chosen. The display shows one synch point detected where a particularly high energy peak is present in both versions. The plug-in attempts to match alignment at this point, adjusting the sections before or after it separately. A shading change is shown at the synch point boundary.

You can add synch points manually by clicking in the synch points area between the start and end selection pointers, then dragging the green pointers to the appropriate locations. In the example (Figure 33), two synch points have been manually inserted.

Synch points can be deleted by right- or control-clicking (Mac single button mouse) on them. They can all be deleted at once using the **Clear** button.

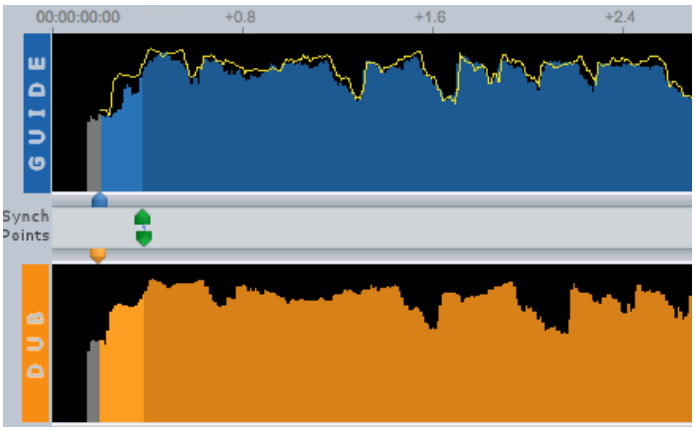


Figure 32 Automatically selected synch points shown in green

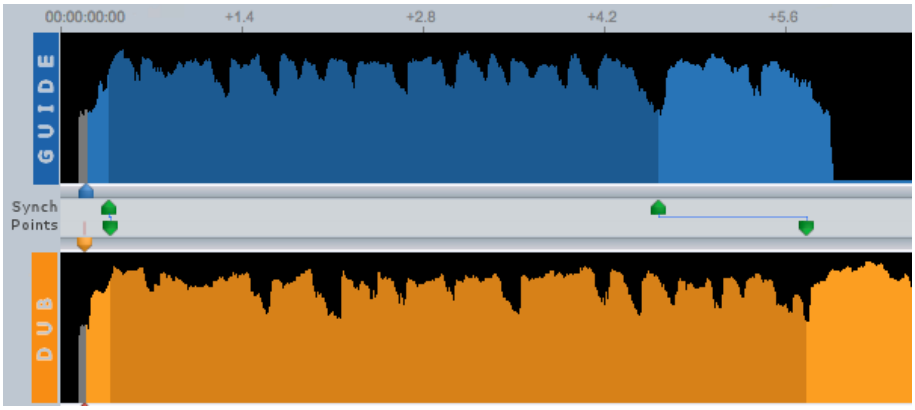


Figure 33 Manually inserted synch points

Protected sections

Sections of the Dub track can be protected so that they are not edited by VocALign. Click in the 'Protect' bar below the Dub display to add a red pointer at the start of the intended section, then drag it to highlight (in red) the relevant area.

The example in Figure 34 uses the material from the tutorial examples. Here the phrase 'unreal time' has been protected so that, after processing, it remains spoken in the rather more languid way used on the Dub track, as opposed to being shortened as on the Guide track. This can be useful, for example, in foreign language dubbing when you want to avoid inappropriate modification of certain words in the dubbed language.

Drag the pointers to alter the starts and ends of the protected section, remembering to press **Edit** again in order to perform a new alignment. Click and drag again in the same bar to add further protected sections. Red pointers can be deleted by right- or control-clicking on them.

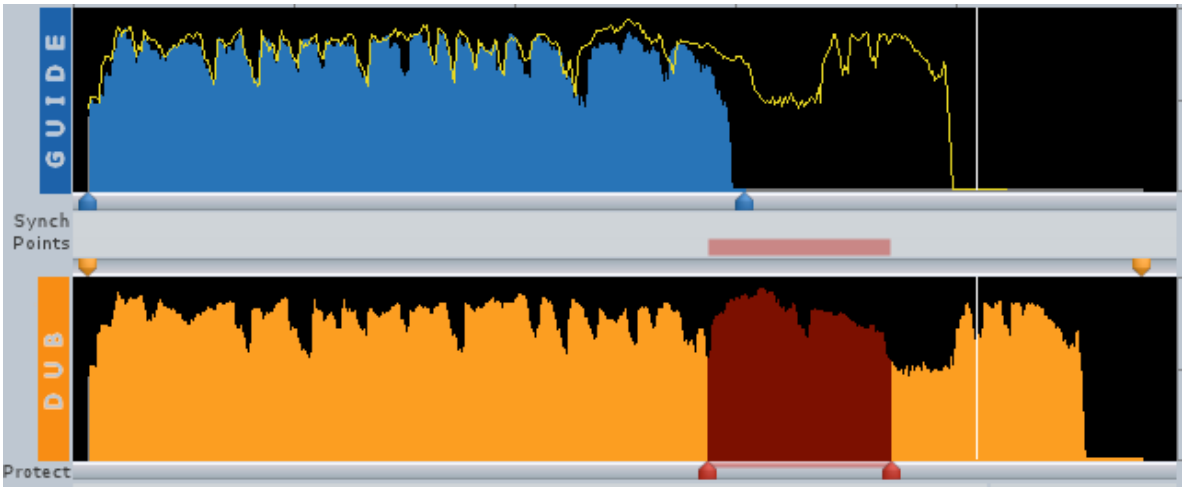
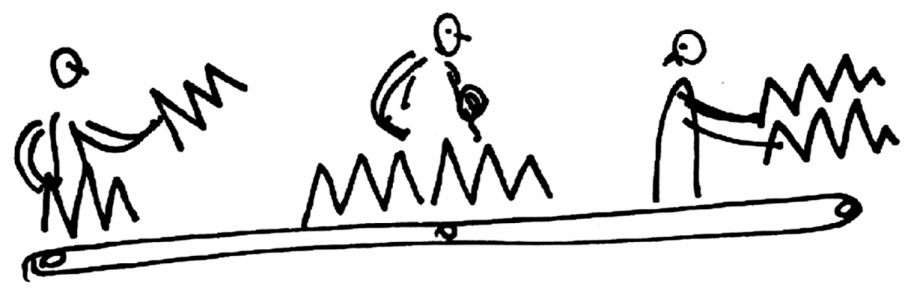


Figure 34 Selecting a protected section using the red sliders



J Troubleshooting

For help and advice, visit the Synchro Arts support website at:

http://www.synchroarts.com/index.php?PAGEID=support